

Report on the RF Testing of:

KYOCERA Corporation
Mobile Phone, Model: EB1065
FCC ID: JOYEB1065



Japan

In accordance with FCC Part 15 Subpart C
(15.209)

Prepared for: KYOCERA Corporation
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Document Number: JPD-TR-20231-0

SIGNATURE			
A handwritten signature in blue ink that reads "Hiro Suzuki".			
NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	21 JAN 2021

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

EXECUTIVE SUMMARY – Result: Complied

A sample of this product was tested and the result above was confirmed in accordance with FCC Part 15 Subpart C (15.209).

The logo for ilac-MRA, featuring a circular emblem with wavy lines and the text "ilac-MRA". The logo for A2LA Accredited, featuring the letters "A2LA" in a stylized font with "ACCREDITED" underneath. Certificate #3686.03	DISCLAIMER AND COPYRIGHT The results in this report are applicable only to the equipment tested. This report shall not be re-produced except in full without the written approval of TÜV SÜD Japan Ltd. We assume no responsibility for damage occurred from error in the information provided by the applicant. ACCREDITATION This test report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.
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1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-20231-0	First Issue	Refer to the cover page

1.2 Standards

CFR47 FCC Part 15 Subpart C (15.209)

1.3 Test methods

ANSI C63.10-2013

1.4 Deviation from standards

None

1.5 List of applied test(s) of the EUT

Test item section	Test item	Condition	Result	Remark
2.1049 RSS-Gen 6.7	Occupied Bandwidth	Radiated	PASS	-
15.209 RSS-Gen 8.9	Transmitter Radiated Spurious Emissions	Radiated	PASS	-
15.207 RSS-Gen 8.8	AC Power Line Conducted Emissions	Conducted	PASS	-

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

16-December-2020 - 15-January-2021

2 Equipment Under Test

All information in this chapter was provided by the applicant.

2.1 EUT information

Applicant	KYOCERA Corporation
	Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan
	Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment Under Test (EUT)	Mobile Phone
Model number	EB1065
Serial number	359787710020784
Trade name	Kyocera
Number of sample(s)	2
EUT condition	Pre-Production
Power rating	Battery: DC 3.85 V
Size	(W) 80.0 mm x (D) 20.0 mm x (H) 168.0 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 °C to 60 °C
Hardware version	DMT2
Software version	0.070VE
Firmware version	Not applicable
RF Specification	
Frequency range	110-205kHz
Antenna type	Loop antenna

2.2 Modification to the EUT

The table below details modifications made to the EUT during the test project.

Modification State	Description of Modification	Modification fitted by	Date of Modification
Model: EB1065, Serial Number: 359787710020784			
0	As supplied by the applicant	Not Applicable	Not Applicable

2.3 Variation of family model(s)

2.3.1 List of family model(s)

Not applicable

2.3.2 Reason for selection of EUT

Not applicable

2.4 Operating mode

[Normal Operation]

- i) EUT is setup on the wireless charge stand.

3 Configuration of Equipment

Numbers assigned to equipment on the diagram in "3.3 System configuration" correspond to the list in "3.1 Equipment used" and "3.2 Cable(s) used".

This test configuration is based on the manufacturer's instruction.

Cabling and setup(s) were taken into consideration and test data was taken under worse case condition.

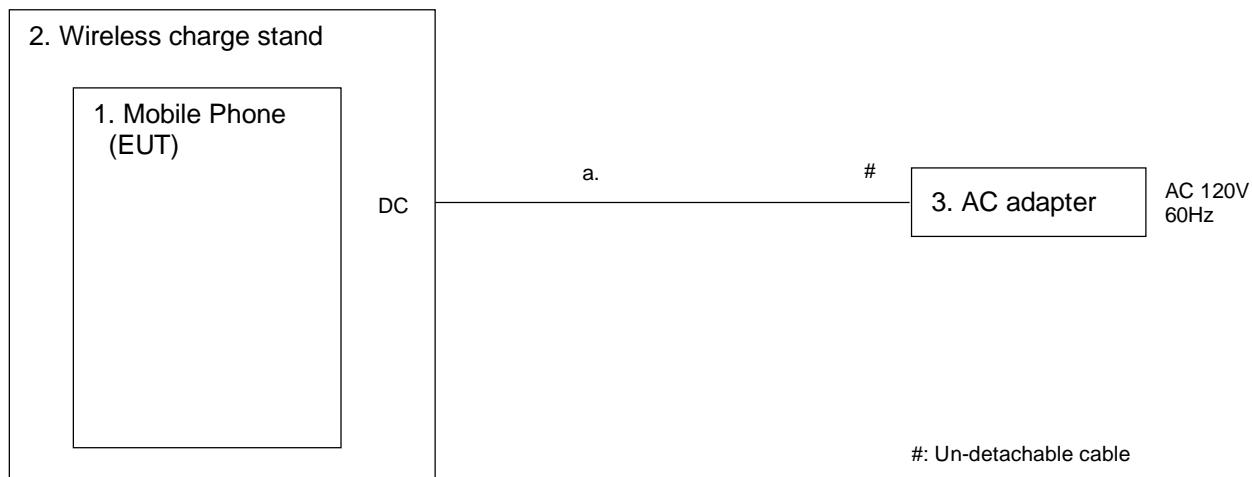
3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	Mobile Phone	KYOCERA	EB1065	359787710020784	JOYEB1065	EUT
2	Wireless charge stand	KDDI	0102PUA	007217	N/A	-
3	AC Adapter	KDDI	0301PQA	N/A	N/A	-

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment
a	DC cable	1.5	Yes	Metal	-

3.3 System configuration



4 Test Result

4.1 Occupied Bandwidth

4.1.1 Measurement procedure

[FCC 2.1049, RSS-Gen 6.7]

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99% bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

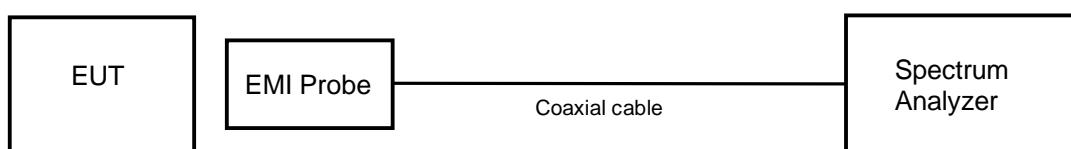
The spectrum analyzer is set to;

- RBW=300Hz, VBW=1kHz, Span=10kHz, Sweep=auto

The test mode of EUT is as follows.

- Normal Operation

- Test configuration



4.1.2 Limit

None

4.1.3 Measurement result

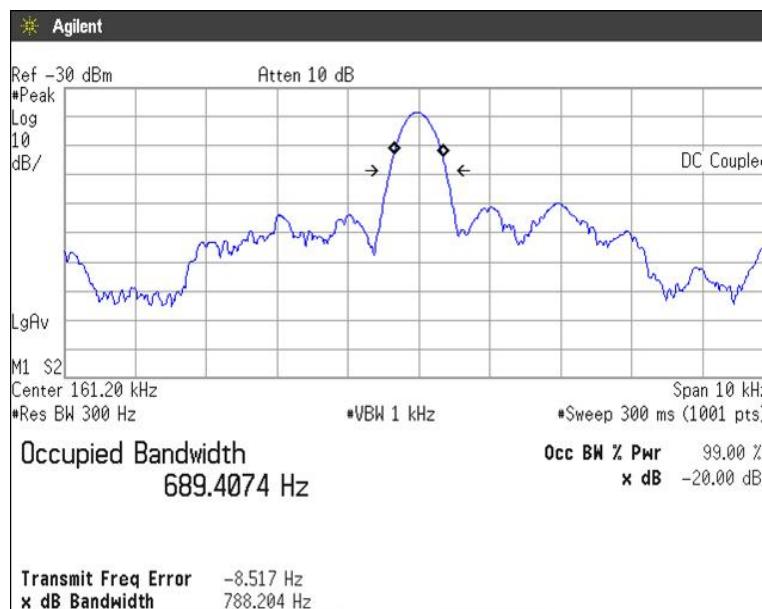
Date : 15-January-2021
 Temperature : 23.7 [°C]
 Humidity : 29.4 [%]
 Test place : Shielded room No.4

Test engineer :

Tadahiro Seino

Frequency (kHz)	Occupied Bandwidth (kHz)
161.20	0.6894074

4.1.4 Trace data



4.2 Radiated Emissions

4.2.1 Measurement procedure

[FCC 15.209, RSS-Gen 8.9]

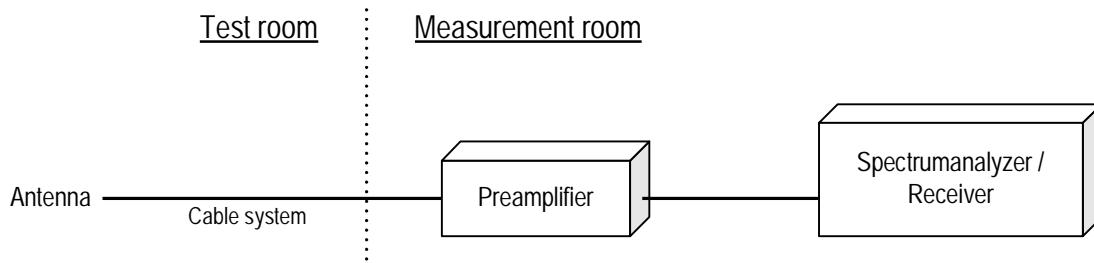
Test was applied by following conditions.

Test method : ANSI C63.10
 Frequency range : 9kHz to 30MHz
 Test place : 3m Semi-anechoic chamber
 EUT was placed on : Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m
 Antenna distance : 3m

Test receiver setting
 - Detector : Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
 - Bandwidth : 200Hz, 9kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 30MHz were performed with test receiver in above setting. The turntable and the Loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



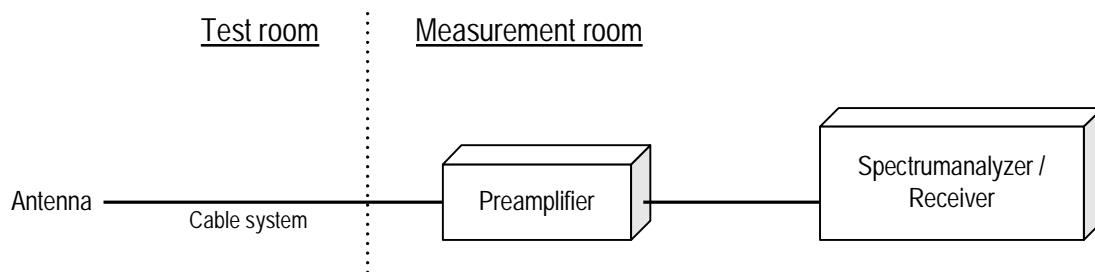
Test was applied by following conditions.

Test method : ANSI C63.10
 Frequency range : 30MHz to 1000MHz
 Test place : 3m Semi-anechoic chamber
 EUT was placed on : Styrofoam table / (W)1.0m x (D)1.0m x (H)0.8m
 Antenna distance : 3m

Test receiver setting
 - Detector : Quasi-peak
 - Bandwidth : 120kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 1000MHz were performed with test receiver in above setting. In order to find the maximum emissions, antenna is adjusted between 1m and 4m in height and varied its polarization (horizontal and vertical), and EUT azimuth was also varied by rotating turntable 0 to 360 degrees. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



4.2.2 Calculation method

[9kHz to 150kHz]

Emission level = Reading + (Ant. factor + Cable system loss)

Margin = Limit – Emission level

[150kHz to 1000MHz]

Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)

Margin = Limit – Emission level

4.2.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	2400 / F [kHz]	20logE [uV/m]	300
0.490-1.705	24000 / F [kHz]	20logE [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. Measurements were corrected to 300m using $40\log(3/300) = -80.0\text{dB}$
Measurements were corrected to 30m using $40\log(3/30) = -40.0\text{dB}$

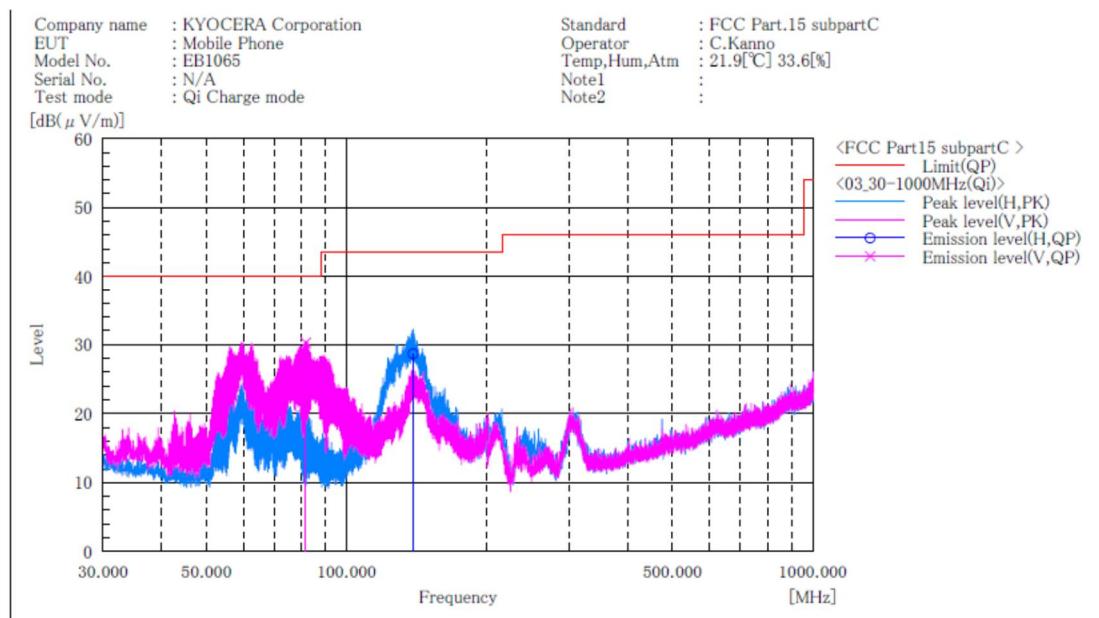
4.2.4 Test data

Date : 16-December-2020
 Temperature : 21.9 [°C]
 Humidity : 33.6 [%]
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

[9kHz to 30MHz]

Frequency (MHz)	Reading [dBuV] At 3m	c.f [dB(1/m)]	Result [dBuV/m] At 3m	Result [dBuV/m] At 300/30m	Limit [dBuV/m] At 300/30m	Margin (dB)	Result
0.024	2.5	24.9	27.4	-52.6	40.0	92.6	PASS
0.057	17.6	24.7	42.3	-37.7	32.5	70.2	PASS
0.077	12.0	24.6	36.6	-43.4	29.9	73.3	PASS
0.160	71.3	-8.2	63.1	-16.9	23.5	40.4	PASS
0.317	48.8	-8.1	40.7	-39.3	17.6	56.9	PASS
0.481	50.8	-8.1	42.7	-37.3	14.0	51.3	PASS
0.503	49.4	-8.1	41.3	1.3	33.6	32.3	PASS
0.669	40.8	-8.1	32.7	-7.3	31.1	38.4	PASS
0.849	42.1	-8.0	34.1	-5.9	29.0	34.9	PASS

[30MHz to 1000MHz]

Final Result

No.	Frequency [MHz]	(P) Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	81.660	V 46.5	-16.2	30.3	40.0	9.7	100.0	181.0
2	138.800	H 41.8	-13.1	28.7	43.5	14.8	305.0	110.0

4.3 AC Power Line Conducted Emissions

4.3.1 Measurement procedure

[FCC 15.207, RSS-Gen 8.8]

Test was applied by following conditions.

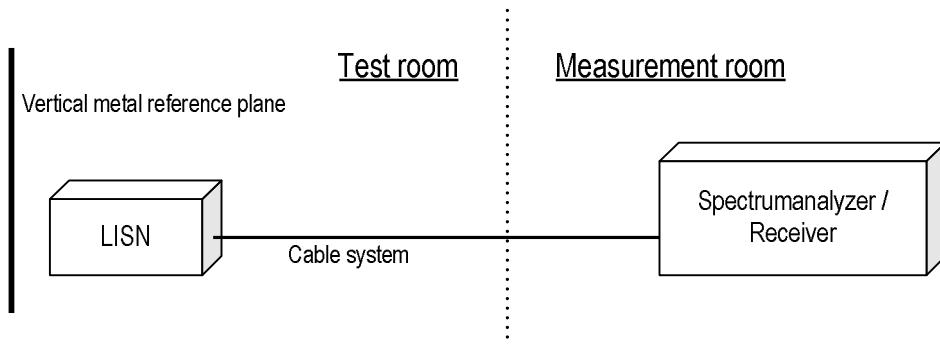
Test method	:	ANSI C63.10
Frequency range	:	0.15 MHz to 30 MHz
Test place	:	3 m Semi-anechoic chamber
EUT was placed on	:	FRP table / (W)2.0 m x (D)1.0 m x (H)0.8 m
Vertical Metal Reference Plane	:	(W)2.0 m x (H)2.0 m 0.4 m away from EUT
Test receiver setting		
- Detector	:	Quasi-peak, Average
- Bandwidth	:	9 kHz

EUT and peripherals are connected to $50\Omega/50\mu\text{H}$ Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.

LISN for peripheral is terminated in 50Ω .

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



4.3.2 Calculation method

Emission level = Reading + (LISN. Factor + Cable system loss)

Margin = Limit – Emission level

Example:

Limit @ 6.770 MHz : 60.0 dB μ V(Quasi-peak)

: 50.0 dB μ V(Average)

(Quasi peak) Reading = 41.2 dB μ V c.f = 10.3 dB

Emission level = 41.2 + 10.3 = 51.5 dB μ V

Margin = 60.0 – 51.5 = 8.5 dB

(Average) Reading = 35.0 dB μ V c.f = 10.3 dB

Emission level = 35.0 + 10.3 = 45.3 dB μ V

Margin = 50.0 – 45.3 = 4.7 dB

4.3.3 Limit

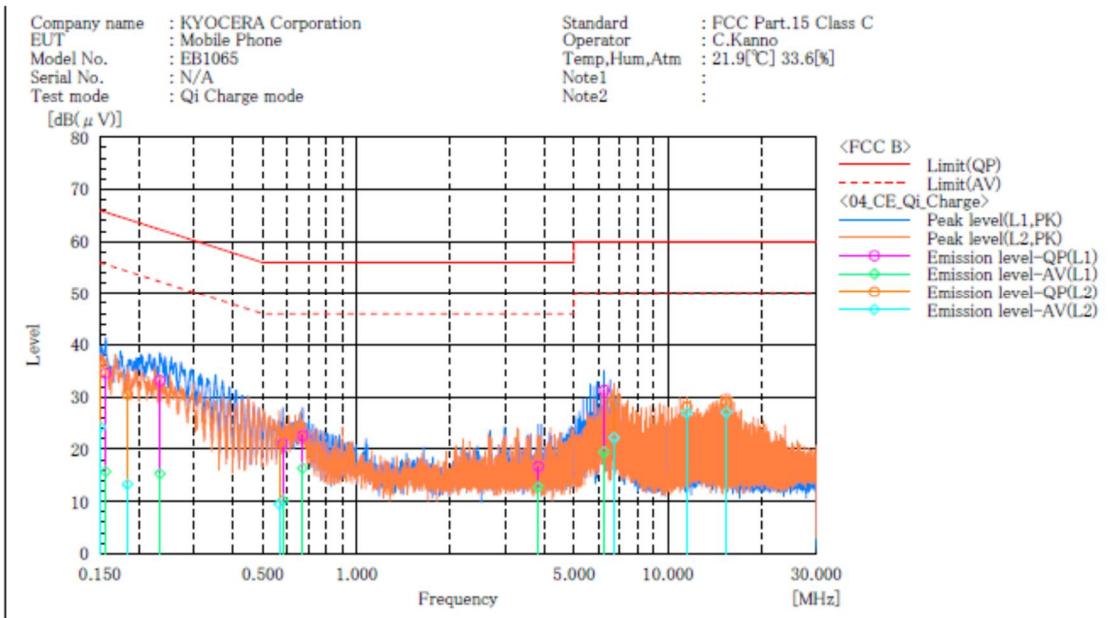
Frequency [MHz]	Limit	
	QP [dB μ V]	AV [dB μ V]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

4.3.4 Test data

Date : 17-December-2020
 Temperature : 22.2 [°C]
 Humidity : 37.6 [%]
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno



Final Result

--- L1 Phase ---											
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV	
	[MHz]	[dB(μV)]	[dB(μV)]		[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]	
1	0.157	24.3	5.4	10.3	34.6	15.7	65.6	55.6	31.0	39.9	
2	0.234	23.0	5.1	10.2	33.2	15.3	62.3	52.3	29.1	37.0	
3	0.580	10.8	-0.1	10.3	21.1	10.2	56.0	46.0	34.9	35.8	
4	0.672	12.3	6.1	10.3	22.6	16.4	56.0	46.0	33.4	29.6	
5	3.839	6.3	2.3	10.4	16.7	12.7	56.0	46.0	39.3	33.3	
6	6.237	20.8	9.0	10.5	31.3	19.5	60.0	50.0	28.7	30.5	

--- L2 Phase ---											
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV	
	[MHz]	[dB(μV)]	[dB(μV)]		[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]	
1	0.151	24.7	14.0	10.3	35.0	24.3	65.9	55.9	30.9	31.6	
2	0.184	20.3	3.0	10.3	30.6	13.3	64.3	54.3	33.7	41.0	
3	0.566	11.0	-0.8	10.3	21.3	9.5	56.0	46.0	34.7	36.5	
4	6.723	18.8	11.6	10.6	29.4	22.2	60.0	50.0	30.6	27.8	
5	11.502	17.4	16.3	10.7	28.1	27.0	60.0	50.0	31.9	23.0	
6	15.387	18.1	16.3	10.8	28.9	27.1	60.0	50.0	31.1	22.9	

5 Antenna requirement

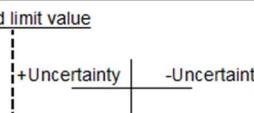
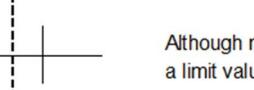
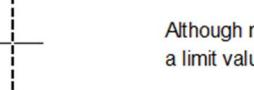
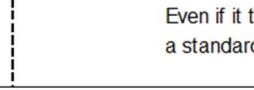
According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

6 Measurement Uncertainty

Expanded uncertainties stated are calculated with a coverage Factor k=2.
 Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028 Parts 1 and 2 determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission, AMN (9 kHz – 150 kHz)	±3.7 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.3 dB
Radiated emission (9kHz – 30 MHz)	±3.7 dB
Radiated emission (30 MHz – 1000 MHz)	±5.3 dB
Radiated emission (1 GHz – 6 GHz)	±4.4 dB
Radiated emission (6 GHz – 18 GHz)	±4.7 dB
Radiated emission (18 GHz – 40 GHz)	±5.8 dB
Radio Frequency	±1.4 * 10 ⁻⁸
RF power, conducted	±0.8 dB
Temperature	±0.6 °C
Humidity	±1.2 %
Voltage (DC)	±0.4 %
Voltage (AC, <10kHz)	±0.2 %

Judge	Measured value and standard limit value		
PASS	Case1		Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2		Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	Case3		Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4		Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

7 Laboratory Information

Testing was performed and the report was issued at:

TÜV SÜD Japan Ltd. Yonezawa Testing Center

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
Phone: +81-238-28-2881
Fax: +81-238-28-2888

Accreditation and Registration

A2LA
Certificate #3686.03

VLAC
Accreditation No.: VLAC-013

BSMI
Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada
ISED#: 4224A

VCCI Council

Registration number	Expiration date
A-0166	03-July-2021

Appendix A. Test Equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Aug-2021	20-Aug-2020
Microwave cable	SUHNER	SUCOFLEX102/2m	31648	31-Mar-2021	26-Mar-2020
EMI Probe	ANRITSU	MA2601C	N/A(1753)	31-Oct-2021	08-Oct-2020

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2021	28-Sep-2020
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Dec-2021	11-Dec-2020
Preamplifier	SONOMA	310	372170	30-Sep-2021	29-Sep-2020
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	30-Apr-2021	15-Apr-2020
Attenuator	TAMAGAWA.ELEC	CFA-01NPJ-6	N/A(S275)	30-Jun-2021	04-Jun-2020
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1333	31-Dec-2021	15-Dec-2020
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1344	31-Dec-2020	04-Dec-2019
Log-periodic antenna	Schwarzbeck	VUSLP9111B	344	30-Apr-2021	17-Apr-2020
Attenuator	TAMAGAWA.ELEC	CFA-01NPJ-6	N/A(S275)	30-Jun-2021	04-Jun-2020
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2021	20-Jul-2020
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1m	my24610/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1.5m	SN MY19309/4	31-Dec-2021	17-Dec-2020
		SUCOFLEX106/7m	41625/6	31-Dec-2021	15-Dec-2020
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.6.0	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	31-May-2021	28-May-2020

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2021	28-Sep-2020
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	31-Jan-2021	18-Jan-2020
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	KNW-407F2	12-17-110-2	30-Jun-2021	03-Jun-2020
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	31-Jan-2021	18-Jan-2020
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	31-Jan-2021	18-Jan-2020
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Jan-2021	18-Jan-2020
PC	DELL	DIMENSION	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V5.4.11	N/A	N/A

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.